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Age.	Ala.	Mich.	U. S.	Age.	Ala.	Mich.	U. S.
36	10.5	21.8	581.6	40	23.2	26.0	922.6
37	8.7	19.2	495.1	41	4.6	12.6	323.6
38	11.3	21.3	594.5	42	6.8	17.5	458.9
39	7.3	17.7	458.0				

There is an evident preference for the tens and fives, and one somewhat less marked for the even numbers, though those next the fives suffer by the greater attractiveness of the latter.

*On the Nature of the Knee-jerk.* WARREN P. LOMBARD, M. D. Reprint from the Journal of Physiology, Vol. X, Nos. 1 and 2.

Of the two opposing theories of the knee-jerk (that it is a direct result of the twitch to the quadriceps muscle, and that it is a full reflex process), the neat experiments of Dr. Lombard strongly support the second. The first has to assume what has yet to be proved, namely, a continuity of muscle-tonus and a dependence of the irritability of the muscle on its tension. The knee-jerk can apparently be present or absent without reference to the presence or absence of tonus, and artificial tension does not restore a lost knee-jerk. It can vary in amount independently of small variations in tension, and vary more rapidly than the irritability of the muscle. The first theory meets a difficulty in the reinforced knee-jerk because moderate reinforcing acts do not change the tension nor the irritability, and another difficulty in the fact, discovered by Mitchell and Lewis, that contractions produced by electrical stimulation cannot be reinforced. Moreover, not only the extensors, but occasionally the flexors also, respond to the stimulating blow—a fact not to be explained by direct stimulation.

*A Contribution to the Study of Muscular Tremor.* FREDERICK PETERSON, M. D. Reprint from Jour. Nerv. and Ment. Disease, Feb. 1889.

This contribution is in the nature of a preliminary study, intended rather to demonstrate a method than to present results. Twenty-five myograms taken in various nervous diseases with an Edwards sphygmograph, which the author recommends for such purposes, are given. The rates of tremor in most cases suffer some modification by the will of the patient, but they may be divided into two groups; one rapid and not far from 10 per second (the normal innervation rate according to Horsley and Schäfer), the other about half that rate. It would seem, therefore, that these diseases in some way make the muscle responsive to single impulses of innervation, or to groups of two or more. The myogram of the tremor of paralysis agitans has been shown by others to be dicrotic. Though recognizing the need of further investigation, the author is inclined to regard all except fibrillary tremors as of central origin.

*Das Kopfschwingen.* J. RICH. EWALD. Pflüger's Archiv, Bd. XLIV, H. 7-8-9.

By *Kopfschwingen* Prof. Ewald means the rapid from-side-to-side vibration of the head that can be voluntarily produced by taking a full breath and tensing up the muscles of the neck. With practice, the vibrations can be executed with those muscles alone, and give graphic

tracings almost as uniform as those of a tuning-fork, (for methods of registration, the original should be consulted). The average rate for the first second was 15-16, never more than 17; in a few persons of more than fifty years, less than 14½. In the same person it was constant, varying for Ewald himself only about half a vibration from the average. It could not be voluntarily changed, was not influenced by practice, and did not depend on the inertia of the head. The vibrations could not be kept up longer than 5-7 seconds, and grew slightly slower after the first second. They differ from tremors in regularity and constancy and in ceasing immediately when the head is fixed, which the fatigue tremor of the same muscles does not do. The author's explanation is that, by the contraction of one muscle and the accompanying movement, its antagonist is stretched, and the stretching makes it more excitable either directly, or reflexly as alleged for the knee-jerk. In trying to get tracings from the somewhat similar motions of the jaw when the teeth chatter, he failed because the attempt always inhibited the motions.

*Ricerche di psicologia sperimentale.* Prof. G. SERGI. Reprint from the *Rivista sperim. di Freniat.*, Vol. XII, fasc. 4, 1886.

Professor Sergi here insists on an objection made by him to Wundt's conception of the central stages (perception, apperception and volition) in simple reaction-times, believing that under the usual circumstances of experiment the processes are not separable. The criticism does not, however, hold with full force against Wundt's present views, published since the appearance of Sergi's article; for in the last edition of his psychology he gives very great prominence to a shortened form of reaction in which the central processes enter but partially or not at all, and, like Sergi, speaks of it as purely reflex. Wundt's pupils have found this form of reaction with light, sound and electrical stimulation. Sergi reports it for sound only, but gives smaller values to it, and finds it under circumstances not admitted by Wundt. With his best subject he gets the following reaction-times:

	Uncorrected mean. s.	Corrected mean. s.	Maximum. s.	Minimum. s.
With signal,	0.070	0.0644	0.093	0.047
Without signal,	0.0577	0.0492	0.0655	0.034
“ “	0.0725	0.067	0.0765	0.059
Barely perceptible sound,	0.0744	0.0688	0.083	0.054

In making the corrected means in the first and third series a single reaction from each was alone excluded; the maxima and minima seem to be for the corrected series. The values given by other experimenters for sound reactions range from 0.11 to 0.18.

Sergi also reaches results flatly contradicting two most widely accepted generalizations of psychometry, namely, that reaction-times with a premonitory signal are a good deal shorter than those without, and that reactions to strong stimuli are quicker than those to faint ones. In the table above there is no evidence of either. With other normal subjects he got for reactions without signal, series that ranged from 0.07 to 0.11, all as low or lower than those usually found with a signal; and with the faint sound, on the only other subject reported, he got an uncorrected mean of 0.097. The stimulus was a